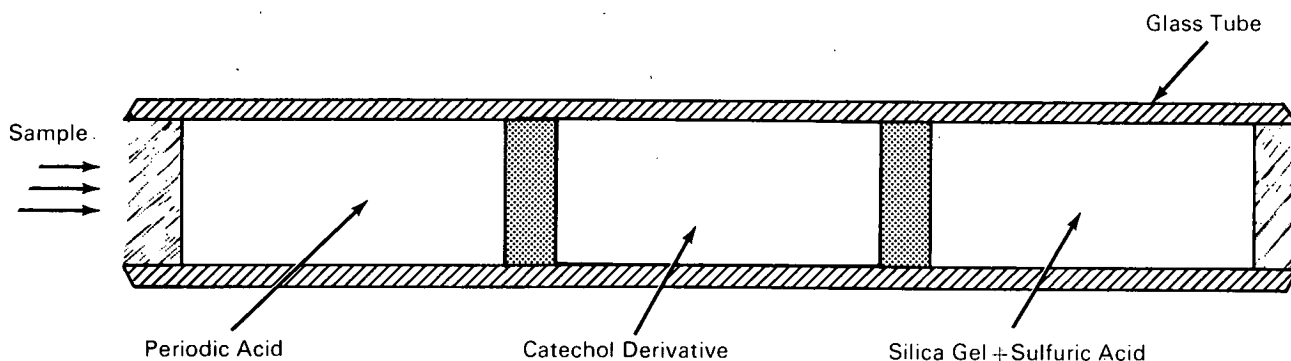


# NASA TECH BRIEF



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## Colorimetric Detection of Ethylene Glycol Vapor



A colorimetric method has been devised for the detection of very low concentrations of ethylene glycol vapor in air or other gases. Ethylene glycol is a common antifreeze and industrial solvent; its vapor is toxic at relatively low concentrations. Thus a simple quantitative test for this vapor would be useful in detecting leaks from systems containing the fluid.

The illustration shows an experimental apparatus which has been used in the laboratory to provide a qualitative colorimetric indication of the presence of ethylene glycol vapor in a gas sample. Further work would be required to establish parameters for obtaining a quantitative estimation of the vapor concentration in the sample.

The experimental apparatus consists of a glass tube with three partitioned compartments containing reagents which successively convert the ethylene glycol vapor into a colored compound. In the first compartment the vapor comes into contact with periodic acid which oxidizes the glycol to formaldehyde. In the second compartment the formaldehyde vapor

reacts with a dimethyl ether derivative of catechol to form a diarylmethylene compound. This compound passes into the third compartment where it is absorbed on a highly pure silica gel substrate impregnated with sulfuric acid which converts the compound to a colored p-quinoidal product.

This series of reactions is highly specific for the detection of ethylene glycol even in the presence of a variety of compounds including aldehydes, ketones, alcohols, ammonia, benzene, toluene, and trichloroethylene. The test could be quantified by correlating the intensity of the color band or its rate of movement in the silica gel with the concentration of the ethylene glycol vapor in the sample.

### Note:

Requests for further information may be directed to:  
Technology Utilization Officer  
Manned Spacecraft Center, Code BM7  
Houston, Texas 77058  
Reference: TSP70-10031

(continued overleaf)

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No patent action is contemplated by NASA.

Source: Charles E. Verostko  
Manned Spacecraft Center  
and Dr. Benjamin Mosier and Carole Helm of  
Institute for Research  
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